

Application No.: 10/815,054
Docket No.: UC0419USNA

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Listing of Claims

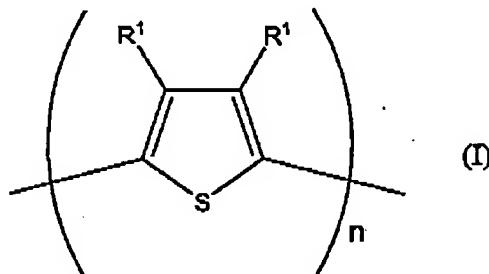
1. (Currently Amended) A composition comprising a non-aqueous dispersion having less than 40% by weight water, said dispersion comprising at least one doped conductive polymer doped with at least one anion selected from the group consisting of organic anions and organic acid anions, and at least one colloid-forming polymeric acid, wherein the conductive polymer is selected from a polythiophene, a polypyrrole, a polyaniline, and combinations thereof.

2. (Currently Amended) A composition according to Claim 1, wherein the conductive polymer is doped with an organic acid anion organic acid anion is selected from the group consisting of non-polymeric organic acids and polymeric organic acids.

3. (Original) A composition according to Claim 2, wherein the organic acid anion is derived from an organic acid selected from a non-polymeric organic acid, a water-soluble polymeric organic acid, and combinations thereof.

4. (Original) A composition according to Claim 1, wherein the pH of the dispersion is between 1 and 8.

5. (Original) A composition according to Claim 1, wherein the polythiophene comprises Formula I:



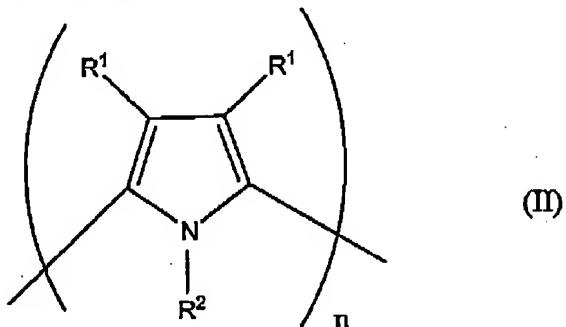
wherein:

R^1 is independently selected so as to be the same or different at each occurrence and is selected from hydrogen, alkyl, alkenyl, alkoxy, alkanoyl, alkythio, aryloxy, alkylthioalkyl, alkylaryl, arylalkyl, amino, alkylamino, dialkylamino, aryl, alkylsulfinyl, alkoxyalkyl, alkylsulfonyl, arylthio, arylsulfinyl, alkoxy carbonyl, arylsulfonyl, acrylic acid, phosphoric

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acid, phosphonic acid, halogen, nitro, cyano, hydroxyl, epoxy, silane, siloxane, alcohol, benzyl, carboxylate, ether, ether carboxylate, ether sulfonate, and urethane; or both R¹ groups together may form an alkylene or alkenylene chain completing a 3, 4, 5, 6, or 7-membered aromatic or alicyclic ring, which ring may optionally include one or more divalent nitrogen, sulfur or oxygen atoms, and n is at least about 4.

6. (Original) A composition according to Claim 1, wherein the polypyrrole comprises Formula II:



wherein:

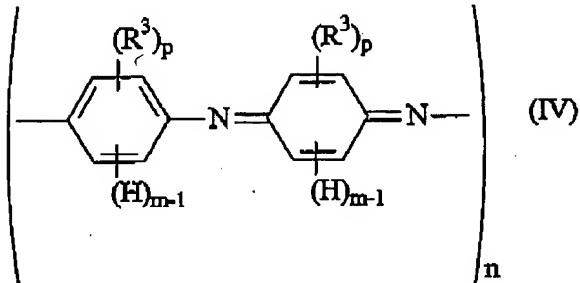
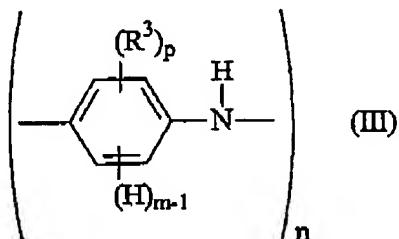
n is at least about 4;

R¹ is independently selected so as to be the same or different at each occurrence and is selected from hydrogen, alkyl, alkenyl, alkoxy, alkanoyl, alkylthio, aryloxy, alkylthioalkyl, alkylaryl, arylalkyl, amino, alkylamino, dialkylamino, aryl, alkylsulfinyl, alkoxyalkyl, alkylsulfonyl, arylthio, arylsulfinyl, alkoxycarbonyl, arylsulfonyl, acrylic acid, phosphoric acid, phosphonic acid, halogen, nitro, cyano, hydroxyl, epoxy, silane, siloxane, alcohol, benzyl, carboxylate, ether, ether carboxylate, ether sulfonate, and urethane; or both R¹ groups together may form an alkylene or alkenylene chain completing a 3, 4, 5, 6, or 7-membered aromatic or alicyclic ring, which ring may optionally include one or more divalent nitrogen, sulfur or oxygen atoms; and

R² is independently selected so as to be the same or different at each occurrence and is selected from hydrogen, alkyl, alkenyl, aryl, alkanoyl, alkylthioalkyl, alkylaryl, arylalkyl, amino, epoxy, silane, siloxane, alcohol, benzyl, carboxylate, ether, ether carboxylate, ether sulfonate, and urethane.

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7. (Original) A composition according to Claim 1, wherein the polyaniline comprises Formula III or Formula IV:



wherein:

n is at least about 4;

p is an integer from 0 to 4;

m is an integer from 1 to 5, with the proviso that p + m = 5; and

R³ is independently selected so as to be the same or different at each

occurrence and is selected from alkyl, alkenyl, alkoxy, cycloalkyl, cycloalkenyl, alkanoyl, alkythio, aryloxy, alkylthioalkyl, alkylaryl, arylalkyl, amino, alkylamino, dialkylamino, aryl, alkylsulfinyl, alkoxyalkyl, alkylsulfonyl, arylthio, arylsulfinyl, alkoxy carbonyl, arylsulfonyl, carboxylic acid, halogen, cyano, or alkyl substituted with one or more of sulfonic acid, carboxylic acid, halo, nitro, cyano or epoxy moieties; or any two R³ groups together may form an alkylene or alkenylene chain completing a 3, 4, 5, 6, or 7-membered aromatic or alicyclic ring, which ring may optionally include one or more divalent nitrogen, sulfur or oxygen atoms.

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8. (Original) A composition according to Claim 1, wherein the non-aqueous dispersion comprises an organic liquid selected from ethers, cyclic ethers, alcohols, polyols, alcohol ethers, ketones, nitriles, sulfides, sulfoxides, amides, amines, carboxylic acids, and mixtures thereof.

9. (Original) A composition according to Claim 1, wherein said colloid-forming polymeric acid is selected from polymeric sulfonic acids, polymeric phosphoric acids, polymeric phosphonic acids, polymeric carboxylic acids, polymeric acrylic acids, and mixtures thereof.

10. (Original) A composition according to Claim 9, wherein said colloid-forming polymer acid comprises a fluorinated polymeric sulfonic acid.

11. (Currently Amended) A composition according to Claim [[10]] 23, wherein said polymeric sulfonic acid is perfluorinated.

12. (Original) A composition according to Claim 11, wherein said non-aqueous dispersion comprises an organic liquid selected from dimethylacetamide, N-methylpyrrolidone, dimethylformamide, ethylene glycol, aliphatic alcohols, and mixtures thereof.

13. (Original) A composition according to Claim 1, further comprising an additional material selected at least one from polymers, dyes, carbon nanotubes, metal nanowires, metal nanoparticles, carbon nanoparticles, carbon fibers, carbon particles, graphite fibers, graphite particles, coating aids, organic and inorganic conductive inks and pastes, charge transport materials, semiconductive or insulating inorganic oxide nanoparticles, piezoelectric, pyroelectric, or ferroelectric oxide nano-particles or polymers, photoconductive oxide nanoparticles or polymers, dispersing agents, crosslinking agents, and combinations thereof.

14. (Original) An electrically conductive or semiconductive layer deposited from a composition according to Claim 1.

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15. (Original) A buffer layer deposited from a composition according to Claim 1.
16. (Original) An electronic device or other application comprising at least one layer comprising at least one composition according to Claim 1.
17. (Original) A device according to Claim 16, wherein the device or application is selected from devices that convert electrical energy into radiation, devices that detect signals through electronics processes, that convert radiation into electrical energy, devices having at least one electronic component, memory storage devices, energy storage devices, antistatic films, biosensor devices, electrochromic devices, and electromagnetic shielding applications.
18. (Currently Amended) A method for making a non-aqueous dispersion of a conductive polymer comprising a step selected from one of the following:
 - (a) dispersing ~~doped~~ conductive polymer solids doped with at least one anion selected from the group consisting of organic anions and organic acid anions, in a non-aqueous dispersion of colloid-forming polymeric acid;
 - (b) dispersing colloid-forming polymeric acid solids in a non-aqueous dispersion of ~~doped~~ conductive polymer doped with at least one anion selected from the group consisting of organic anions and organic acid anions; and
 - (c) combining a non-aqueous dispersion of ~~doped~~ conductive polymer doped with at least one anion selected from the group consisting of organic anions and organic acid anions, with a non-aqueous dispersion of colloid-forming polymeric acid; wherein said non-aqueous dispersion of a doped conductive polymer comprises less than 40% by weight water.
19. (Original) A method according to Claim 18, wherein a colloid forming polymeric acid is added to a non-aqueous dispersion of doped conductive polymer
20. (Original) A method according to Claim 18, wherein a doped conductive polymer solid is added to a non-aqueous dispersion of a colloid forming polymeric acid.

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21. (Original) A method according to Claim 18, 19, or 20, wherein the doped conductive polymer and colloid-forming polymeric acid are further blended using a technique selected from sonication and microfluidization.

22. (Previously Presented) A method for making a non-aqueous dispersion of a conductive polymer comprising less than 40% by weight water, the method comprising: combining a non-aqueous dispersion of doped conductive polymer with a non-aqueous dispersion of colloid-forming polymeric acid.

23. (New) A composition according to Claim 9, wherein said fluorinated polymeric sulfonic acid is an FSA polymer.